Claims

1. A multi-stage automatic transmission, with an input drive shaft (AN), and an output drive shaft (AB), at least three single planetary gear sets (RS1, RS2, RS3), as well as at least three shifting elements (a to E), wherein:

- the three planetary gear sets (RS1, RS2, RS3) are aligned coaxially to one another,
- the second planetary gear set (RS2), as seen spatially, is placed between the first and the third planetary gear sets (RS1, RS3),
- one sun gear (SO3) of the third planetary gear set (RS3) is secured above the first shifting element (A) an a transmission housing (GG) of the multi-stage automatic transmission,
- the input drive shaft (AN) is connected with a sun gear (SO2) of the second planetary gear set (RS2),
- the input drive shaft (AN) is connected by means of the second shifting element (B) with a sun gear (SO1) of the first planetary gear set (RS1) and/or by means of the fifth shifting element (E) with a spider (ST1) of the first planetary gear set (RS1),
- alternatively, the sun gear (SO1) of the first planetary gear set (RS1) is affixed by means of the third shifting element (C) and/or the spider (ST1) of the first planetary gear set (RS1) by means of the fourth shifting element (D) on the transmission housing (GG),
- the output drive shaft (AB) is connected with an internal gear HO1 of the first planetary gear set (RS1) and with one of the spiders (ST2, ST3) of the second or the third planetary gear set (RS2, RS3)

therein in characterized, in that the third and the fourth shifting element (C, D), seen spatially, are placed radially above one another and in that the fifth (E) and the second (B) shifting element, seen spatially, are placed radially above one another.

2. A multi-stage automatic transmission in accord with claim 1, therein characterized, in that the third shifting element (C), seen spatially, is placed radially

underneath the fourth shifting element (D), whereby especially disks (300) of the third shifting element (C) possess a smaller diameter than do the disks (400) of the fourth shifting element.

3. A multi-stage automatic transmission in accord with claim 2, therein characterized, in that a servo apparatus (310) of the third shifting element (C), when seen spatially, is at least predominately placed underneath a servo apparatus (410) of the fourth shifting element (D).

4. A multi-stage automatic transmission in accord with one of the claims 1 to 3, therein characterized, in that the servo apparatuses (310, 410) of the third and the fourth shifting elements (C, D) are integrated in common within a housing wall GW affixed to the principal transmission housing GG, which form an outer wall of the said principal transmission housing GG.

5. A multi-stage automatic transmission in accord with one of the claims 1 to 3, therein characterized, in that the servo apparatuses (310, 410) of the third and the fourth shifting elements (C, D) are integrated in common within an intermediate housing wall GZ, which, spatially observed, is placed axially between the first planetary gear set RS1 and the second and/or fifth shifting element (B, E).

6. A multi-stage automatic transmission in accord with one of the claims 1 to 5, therein characterized, in that the servo apparatus (310) of the third shifting element (C) activates the disks (300) of the third shifting element (C), and/or the servo apparatus (410) of the fourth shifting element (D) activates the disks (400) of the fourth shifting element (D) in the direction of the first planetary gear set (RS1).

7. A multi-stage automatic transmission in accord with one of the claims 1 to 6, therein characterized, in that the disks (500 of the fifth shifting element (E) are placed radially beneath the disks (200) of the second shifting element (B).

8. A multi-stage automatic transmission in accord with one of the claims 1 to 7, therein characterized, in that the fifth shifting element (E) is placed at least predominately within a clutch space of the second shifting element (B), which is formed by means of a clutch cylinder of the second shifting element (B).

9. A multi-stage automatic transmission in accord with claim 8, therein characterized, in that the clutch space of the second shifting element (B) is formed by means of an input element (220) of the second shifting element, which is connected with the input drive shaft AN.

10. A multi-stage automatic transmission in accord with claim 8, therein characterized in that the clutch space of the second shifting element (B) is formed by means of an output element (230) of the second shifting element, which said output element is connected with the sun gear (SO1) of the first planetary gear set (RS1).

11. A multi-stage automatic transmission in accord with claim 8, 9 or 10, therein characterized, in that a servo apparatus (510) of the fifth shifting element (E) is placed at least predominately within the clutch space of the second shifting element (B).

12. A multi-stage automatic transmission in accord with one of the claims 1 to 11, therein characterized, in that the servo apparatus (510) of the fifth shifting element (E) is supported on the input drive shaft (AN).

13. A multi-stage automatic transmission in accord with one of the claims 1 to 12, therein characterized, in that a servo apparatus (210) of the second shifting element (B) is supported on the input drive shaft (AN).

14. A multi-stage automatic transmission in accord with one of the claims 1 to 3 or 5 to 12, therein characterized, in that a servo apparatus (210) of the second shifting element (B) is supported on the hub (GN) of the housing wall GW which is attached to the housing GG.

15. A multi-stage automatic transmission in accord one of the claims 7 to 14, therein characterized, in that the second shifting element (B) possesses a dynamic pressure compensation, the pressure compensation space (211) of which is formed by a servo apparatus (210) of the second shifting element (B) and a clutch cylinder of the fifth shifting element (E).

16. A multi-stage automatic transmission in accord with claim 15, therein characterized, in that the pressure compensation space (211) of the second shifting element (B) is formed by a piston of the servo apparatus (210) of the

second shifting element (B) and an outside disk carrier (520) of the fifth shifting element (E).

17. A multi-stage automatic transmission in accord one of the claims 1 to 16, therein characterized, in that the servo apparatus (210) of the second shifting element (B) activates the disks (200) of the second shifting element (B) and/or the servo apparatus (510) of the fifth shifting element (E) activates the disks (500) of the fifth shifting element (E) axially in the direction of the first planetary gear set RS1.

18. A multi-stage automatic transmission in accord with one of the claims 1 to 17, therein characterized, in that an output element (230) of the second shifting element (B) at least partially overlaps the disks (500) of the fifth shifting element (E) radially in the axial direction.

19. A multi-stage automatic transmission in accord with one of the claims 1 to 18, therein characterized, in that the third and/or the fourth shifting element (C, D) is placed on that side of the planetary gear set RS1 which is remote from the second planetary gear set RS2.

20. A multi-stage automatic transmission in accord with claim 19, therein characterized, in that the third and the fourth shifting element (C, D), especially the disks (300, 400) of the third and the fourth shifting element (C, D) border directly axially on the first planetary gear set RS1 upon that side thereof which is remote from the second planetary gear set RS2.

21. A multi-stage automatic transmission in accord with one of the claims 1 to 20, therein characterized, in that the second and the fifth shifting element (B, E) are placed on that side of the first planetary gear set (RS1) which is remote from the second planetary gear set (RS2).

22. A multi-stage automatic transmission in accord with claim 20, therein characterized, in that the second and the fifth shifting element (B, E) border directly axially on the housing wall (GW), which is affixed to the housing, which forms an outer wall of the transmission housing (GG).

23. A multi-stage automatic transmission in accord with claim 21 or 22, therein characterized, in that the third and/or the fourth shifting element (C, D),

spatially observed, is placed axially between the first planetary gear set (RS1) and the second and/or fifth shifting element (B, E).

24. A multi-stage automatic transmission in accord with claim 23, therein characterized, in that the second and the fifth shifting element (B, E) is placed on that side of the intermediate housing wall (GZ) which is remote from the first planetary gear set (RS1).

25. A multi-stage automatic transmission in accord with claim 24, therein characterized, in that the disks (200, 500) of the second and/or the fifth shifting elements (B, E) border axially directly on the intermediate housing wall (GZ).

26. A multi-stage automatic transmission in accord with one of the claims 1 to 3 or 5 to 25, therein characterized , in that the intermediate housing wall (GZ) is centrally penetrated by a sun gear shaft (SOW1) which is designed as an internal gear, by means of which, an output element 230 of the second shifting element (B) becomes bound with the sun gear (SO1) of the first planetary gear set (RS1), whereby radially, thee runs within this sun shaft (SOW1) a spider shaft (STW1) which likewise has been constructed as an internal gear, by means of which an output element (530) of the fifth shifting element (E) is bound with the spider (ST1) of the first planetary gear set (RS1), and whereby radially within this spider shaft (STW1) the input rive shaft (AN) runs.

27. A multi-stage automatic transmission in accord with claim 21 or 22, therein characterized, in that the second and the fifth shifting element (B, E) border directly and axially on the first planetary gear set (RS1) on that side thereof which is remote from the second planetary gear set (RS2).

28. A multi-stage automatic transmission in accord with one of the claims 1 to 27, therein characterized, in that the first shifting element (A), when spatially observed, is placed on that side of the third planetary gear set (RS3) which is remote from the second planetary gear set (RS2).

29. A multi-stage automatic transmission in accord with claim 28, therein characterized, in that a servo apparatus (110) of the first shifting element (A) is integrated into the transmission housing (GG) or in a housing wall (GW) which is secured in said transmission housing (GG).

30. A multi-stage automatic transmission in accord with one of the claims 1 to 29, therein characterized, in that an outside disk carrier of the first shifting element (A) is integrated in the transmission housing (GG).

31. A multi-stage automatic transmission in accord with one of the claims 1 to 30, therein characterized, in that the input drive shaft (AN) and the out put drive shaft (AB) run coaxial to one another.

32. A multi-stage automatic transmission in accord with claim 31, therein characterized, in that output drive shaft (AB) which is operationally bound with the internal gear (HO1) of the first planetary gear set (RS1), centrally penetrates the third planetary gear set (RS3) in the axial direction.

33. A multi-stage automatic transmission in accord with claim 31 or 32, therein characterized, in that the output drive shaft (AB), which is operationally bound with the internal gear (HO1) of the first planetary gear set (RS1), centrally and in an axial direction, penetrates a clutch space of the first shifting element (A).

34. A multi-stage automatic transmission in accord with one of the claims 1 to 30, therein characterized in that the input drive shaft (AN) and the output drive shaft (AB) do not run coaxially with one another, since especially, the said input drive shaft (AN) and the output drive shaft (AB) run axis parallel, or angularly, with one another.

35. A multi-stage automatic transmission in accord with claim 34, therein characterized in that the output drive shaft (AB), when spatially observed in the zone radially above the first and/or the second and/or the third planetary gear set (RS1, RS2, RS3) is operationally connected with the internal gear (HO1) of the first planetary gear set (RS1).

36. A multi-stage automatic transmission in accord with one of the claims 1 to 35, therein characterized, in that the internal gear (HO1) of the first planetary gear set (RS1) and the spider (ST3) of the third planetary gear set (RS3) and the output drive shaft (AB) are continually connected with one another and in that the spider (ST2) of the second planetary gear set (RS2) is continually in connection with an internal gear (HO3) of the third planetary gear set (RS3) and in that the

spider (ST1) of the first planetary gear set (RS1) is continually in contact with an internal gear (HO2) of the second planetary gear set (RS2).

37. A multi-stage automatic transmission in accord with one of the claims 1 to 35, therein characterized, in that the internal gear (HO1) of the first planetary gear set (RS1) and the spider (ST2) of the second planetary gear set (RS2) and the output drive shaft AB are all continually in contact with one another, and in that the spider (ST3) of the third planetary gear set (RS3) is continually in contact with an internal gear (HO2) of the second planetary gear set (RS2) and in that the spider (ST!) of the first planetary gear set (RS1) is continually connected with an internal gear (HO3) of the third planetary gear set (RS3).

38. A multi-stage automatic transmission in accord with one of the claims 1 to 37, therein characterized, in that by means of selective closure of the shifting element (A to E), at least six forward gears can be so shifted into, that for the change in gear from one gear into the next successive higher gear, or into the next successive lower gear, from the presently activated gear, in each case, only one shifting element need be opened and an additional shifting element closed.

39. A multi-stage automatic transmission in accord with one of the claims 1 to 38, therein characterized, in that the shifting elements are closed as follows: in the first forward gear, the first and fourth shifting elements (A, D), in the second forward gear, the first and third shifting elements (A, C) and in the third forward gear, the first and second shifting element (A, B), in the fourth forward gear, the first and fifth shifting element (A, E), in the fifth forward gear, the second and fifth shifting element (B, E), in the sixth forward gear, the third and fifth shifting element (C, E), and in reverse gear, the second and fourth shifting element (B, D).